

IMPORTANT!  
READ ME FIRST

# FireChief<sup>TM</sup>



USER GUIDE

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mastering the science of digital forensics

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There are no serviceable parts inside the FireChief. If you require service, do not attempt to open or disassemble FireChief device due to a shock hazard. Opening or disassembling FireChief case (except at the request of DI Technical Support) will void the warranty.

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## Package Contents

The following is included with the FireChief:

- FireChief 800 (1)
- Power cord (1)
- FireWire Cable (9-pin to 9-pin) (1)
- FireWire Adapter (9-pin to 6-pin) (1)
- FireWire Adapter (9-pin to 4-pin) (1)
- SATA Drive Tray (2)
- User Guide (1)

## What is the FireChief

FireChief is a dual bay FireWire to IDE/SATA enclosure with a drive bay that is hardware write protected (ReadOnly) and a drive bay that is write enabled (Read/Write). The FireChief allows a *suspect* IDE/SATA hard drive (to be write protected) and a *target* IDE/SATA hard drive (used for forensic copy) to be connected to a computer via IEEE 1394 (FireWire) interface for the purpose of forensic acquisition and analysis. FireChief supports connection to a host computer via FireWire 400 (1394a) or FireWire 800 (1394b) interfaces. By default the upper drive bay labeled ReadOnly is configured as Read-Only and the lower drive bay labeled Read/Write is configured as read/writeable.

## Power Considerations

The FireChief's internal power supply (110-220VAC auto switching) provides the required power connections for the internal drive bays and any attached hard drives. Connect the power cable to the back of FireChief and plug into an outlet. Power up the FireChief using the power button on the front of the enclosure.

## FireChief cabling to PC

FireChief is connected to a host computer via a single FireWire cable and adapter if required. Any of the four FireWire 800 connectors on the back of the FireChief may be used. The upper FireWire bridge is connected to the upper drive bay (ReadOnly) and is configured as Read Only. The lower FireWire bridge is connected to the lower drive bay (Read/Write ) and is configured as Read/Writeable.

Any of the unused FireWire ports can be used to daisy chain (cascade) additional FireWire devices from the FireChief (i.e. acts as a FireWire Hub.)

## Drive Configuration

Before connecting an IDE disk drive to the FireChief, the drive **must** be configured (jumped) as a **Single Master Device**. Both hard drives must be configured (jumped) as a Master IDE Device. Certain models of IDE hard drives (Western Digital) may specifically require the device to be configured as a "Master Device in a Single Drive Configuration" (no Slave device present on IDE Channel).

## Diagnostic LED's

Each drive rack has a green power LED indicates the drive tray is powered and locked into place.

In addition, each FireWire bridge board on the back of the FireChief has an amber LED. ON indicates the bridge is in Read Only Mode. OFF indicates that bridge is in Read/Writeable mode.

Remember: The upper FireWire bridge is connected to the upper drive bay (ReadOnly) and is configured as Read Only. The lower FireWire bridge is connected to the lower drive bay (Read/Write) and is configured as Read/Writeable.

## Drivers

No device specific drivers are required for the FireChief. Full driver support is provided by the Host operating system and/or FireWire controller. Normally, the necessary drivers will automatically be loaded by the operating system. Please refer to your operating system, motherboard, or FireWire controller manufacturer for additional driver related information.

## Cables

Use only high quality FireWire cables. FireWire 400 to FireWire 800 adapters (4 pin to 9 pin and 6 pin to 9 pin) are included with your kit to allow you to hook-up the FireChief to FireWire 400 connectors.

## Drive Bays, Trays and Racks

**"Drive Bays"** are the positions in the chassis provided to facilitate insertion, removal, and reconfiguration of hard drives. A Drive Bay consists of two pieces, the Drive Rack and the Drive Tray.

**"Drive Trays"** are the removable portion of the drive bay which holds the hard drive.

**“Drive Racks”** are the part of the drive bay that mounts permanently inside the system chassis.

The FireChief includes 2 SATA Drive Racks, 2 SATA Trays and 2 BRIDGE Trays (for IDE hard drives). The Drive Racks are mounted in the FireChief case. **The Drive Racks have a SATA interface and will only accept SATA or BRIDGE Trays.** The Drive Racks will not accept older IDE trays used with previous FireChiefs.

## Identifying Drive Trays

Drive trays have two interfaces which identify how they may be used. One interface specifies how the tray is connected to the rack and the other interface specifies what type of drive it can accept. The tray/rack interface type is printed on the bottom rear of the tray. The drive type interface is printed on the top front of the tray. The FireChief ships with two types of trays. Bridge Trays which accept IDE drives and SATA Trays which accept SATA drives.

<u>Tray Type</u>	<u>Rack Interface (Bottom Rear)</u>	<u>Drive Type (Top Front)</u>
SATA	SATA	SATA
BRIDGE	SATA	IDE

## Connecting the FireChief

**Make sure the FireChief is powered off prior to connecting a hard drive.**

1. **Connect the Hard Drive to the appropriate drive tray (IDE or SATA)**  
**IDE:** Connect the short 80 conductor/40 pin ribbon cable to the IDE connector on the back of the hard drive making sure the connector is properly aligned and seated. **SATA:** Connect the small black connector to the back of the hard drive making sure the connector is properly aligned and seated.
2. **Connect Power Adapter:** **IDE:** Connect the power connector to the 4-pin power connector on the hard drive again making sure the connector is properly aligned and seated. **SATA:** Connect the large black connector to the back of the hard drive making sure the connector is properly aligned and seated.
3. **Inserting the drive tray into the FireChief:** Close the drive tray and insert the drive tray back into the appropriate drive bay and lock in place.
4. **Connect FireChief to host computer:** Power on FireChief and connect the FireWire cable to the host computer's FireWire controller.

## Swapping Drives

1. ***“Stop”, “Unload”, or “Dismount” the FireWire device using the applicable operating system icon, process, or utility.*** This will notify the operating system to complete any pending transfer operations so that the device can be properly disconnected.
2. ***Disconnect FireChief:*** Disconnect the FireWire cable from the host computer.
3. ***Power off the FireChief***
4. ***Remove existing drive:*** Once the FireChief has been powered off the drive tray maybe unlocked and removed from the unit. Disconnect both the 4 pin power connector and 40 pin data cable from the hard drive.
5. ***Attach new drive:*** Install the new hard drive in the drive tray making sure both data and power connectors are connected. Place drive tray back into drive bay again lock into place.
6. ***Reconnect FireChief to host computer:*** Power on FireChief and reconnect the FireWire cable to the host computer's FireWire controller.
7. ***Power on the FireChief***

## Disconnecting the FireChief

1. ***“Stop”, “Unload”, or “Dismount” the FireWire device using the applicable operating system icon, process, or utility.*** This will notify the operating system to complete any pending transfer operations so that the device can be properly disconnected.
2. ***Disconnect FireChief:*** Disconnect the FireWire cable from the host computer.
3. ***Power off the FireChief***
4. ***Drive trays may now be removed from the unit.***

## Modifying your FireChief's Read/Write Capabilities

The FireChief is shipped by default with one Read Only (write blocking) drive bay and one Read/Writeable Drive bay. However, it can be configured to enable Read-Only or Read-Write operation for both drive bays if desired. There are a series of DIP switches on each of the FireWire bridges that control this functionality.



The default for the Read Only bridge is all switches turned OFF (Read Only). The default for the Read/Writeable bridge is with switch #1 ON and all other switches (#2, #3, and #4) turned OFF (Read Write).

When Switch #1 is OFF the bridge will operate with all writes being blocked (Read Only). When switch #1 is ON the bridge will operate with writes enabled (Read Write).

Switches #2 and #3 control how the unit responds when placed in Read Only mode and are intended for diagnostic operations and to help support operating systems which do not fully support read-only devices. These switches are ignored if the unit is configured for Read Write.

Switch #2 controls whether an error code is returned when a write is attempted. If the switch is OFF, an error will be generated when a write is attempted. If the switch is on, a success code will be returned to make believe the write succeeded.

Switch #3 controls what type of code page (device characteristics) is reported to the calling process when a device query is made. If the switch is OFF, the code page is reported appropriately to indicate that the device is write protected. If the switch is ON, the code page is reported as if the device was not write protected.

## Summary of Switch Settings

**Switch 1:** OFF = Read-Only (write-blocking enabled)  
ON = Read-Write

**Switch 2:** Only functions if Switch 1 = OFF, i.e., read-only  
OFF = Unit reports errors if writes are attempted  
ON = Unit suppresses errors if writes are attempted (no-error)

**Switch 3:** Only functions if Switch 1 = OFF, i.e., read-only  
OFF = Unit reports Write-Protect (WP) status in code page  
ON = Unit suppresses Write-Protect (WP) status in code page

**Switch 4:** Reserved

## Important Considerations

**Removal of Drives.** **DO NOT** unlock the drive bay or disconnect the hard drive from the FireChief while the device is powered on.

**Disk Cache.** When using an operating system that cache disk writes (Windows 95/98/ME for example), it may appear information has been written to the drive (via Windows Explorer for example); when in actuality the information has only

been stored in the disk cache. A subsequent reboot of the system will clear the disk cache and show that no changes/modifications were made to the write protected drive. Pressing "CTRL-C" in MS-DOS will cause the disk cache to be reset and show this fact as well. Most forensic imaging software uses direct disk access to read directly from the disk itself, the contents of the operating system disk cache will not effect the ability to image the disk. (This includes the "\_Restore" directory created by Windows ME).

**NTFS Drive Letter Access.** Windows NT/2K/XP may attempt to update (write to) an NTFS file system the first time the volume it is attached to a system. In the event that Windows tries to perform this update, the write attempts to the drive will be blocked. This will prevent Windows from providing logical disk access to the attached NTFS file system, effectively resulting in an NTFS file system for which no drive letter is assigned. This condition is a function of the Windows NT/2K/XP operating system and happens specifically because the Write Blocker is performing properly. Although logical disk access will not be provided, the drive will still be able to be forensically imaged at the physical level.

**INT13X (LBA) Support.** Some small drives, which report to support Int13X (LBA), but do not implement this method correctly, may not function properly with this device. These drives are typically quite old and always less than 8 GB in size, and are usually less than 2 GB in size.

**Using a FireWire 800 Device with Microsoft Windows.** Microsoft Windows 1394 drivers do not identify which port (1394a or 1394b) is being used when a multiport FireWire device is attached. Because of this, if two 1394b (800 Mb/s) capable components (i.e. a controller and a device) are connected via a 1394a (400 Mb/s) cable, the negotiation speeds of the devices will not be set properly and the components (controller and device) will not properly establish communications. When operating in a Microsoft Windows environment, always use 1394b cables to connect a 1394b capable controller and device.

**Microsoft Windows XP Service Pack 2.** With SP2, the performance of FireWire 800 (1394b) capable devices will be effectively reduced down to the lowest possible negotiation speed. (Well below that of FireWire 400/1394a devices). This problem will occur even if the FireWire 800 (1394b) capable device is attached to a FireWire 400 (1394a) controller or via FireWire 400 (1394a) cables. Only one controller or device on the FireWire chain needs to be FireWire 800 (1394b) CAPABLE for this problem to occur. Users who install Windows XP SP2 will notice a severe reduction in performance when using FireWire to connect 1394b capable devices to the host PC. FireChief has implemented a firmware "workaround" for the Microsoft's Windows XP SP2 1394/FireWire drivers that allow users to take full advantage of the FireChief.

**Firmware updates.** If there is a need to update firmware please consult Digital Intelligence web site support pages:

***<http://www.digitalintelligence.com/support.php>***

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Digital Intelligence, Inc.  
17165 W. Glendale Dr.  
New Berlin, WI 53151  
P: 262.782.3332  
F: 262.782.3331